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UNIVERSITY OF
TECHNOLOGY

Advanced Environmental Sensing Industry Masterclass

8 - 9 June 2018
Wantirna campus

Presented by Swinburne University of Technology
in collaboration with Global Urban Forest and Our Sci



Global Urban Forest
Soil Health • Tree Health







Welcome

The Department of Trades and Engineering Technology invite you to a world-first in collaborative research: The Advanced Environmental Sensing Industry Masterclass. Explore with industry-leading figures how we currently understand, manage, invest and protect environments such as Urban Forestry and Agriculture, and how technology is transforming vital industries.

This world-first masterclass is based on three years of global collaboration between Australian company Global Urban Forest, US company OurSci and PhotosynQ LLC at Michigan State University.

Understanding natural environments has never

been more important for the longevity of current and future generations. The complexities of ecosystems both in natural and urban environments are still being uncovered.

Technology is changing how we manage, invest and protect environments, including Urban Forestry and Agriculture.

Greater environmental understanding and best-practice management, underpinned by robust science, will have a profound impact on human health in the future.

We are on the cusp of a quantum leap in environmental science, and we could create a valuable legacy for future generations by benchmarking the complexities of the natural world.

Presenters



MATTHEW ROBIN-DANIEL

Founder - Global Urban Forest Pty Ltd
Beta Tester - PhotosynQ - Experts Program
Partner - OurSci.net - LLC
Developer - TREE HEALTH CALCULATOR 1.0

Matthew is a global leader in advanced holistic urban tree management, Scholarship-trained in Tasmania as a climbing Arborist and Horticulturalist with Launceston City Council. Matthew's career was established in the core principles of holistic tree and soil management. After leaving Tasmania he developed as an expert in

advanced confined space low impact rigging removal of large and dangerous trees, formative and remedial pruning and tree restoration using microbial interaction.

Matthew's goal is to raise the scientific profile of global Arboriculture, developing new techniques based on measures of tree and soil health status. Sharing knowledge and passion in advanced Urban Forest management and providing a baseline of environmental science to following generations of Urban Foresters.



GREG AUSTIC

Greg is an open technology advocate, co-organizer of the Gathering of Open Science Hardware GOSH and the Gathering for Open Ag Tech (GOAT). He's a jack of all trades capable of getting an idea off the ground quickly and inexpensively. Prior to co-founding Our Sci, he led the development of the MultispeQ, a low-cost photosynthesis meter, and PhotosynQ, a platform for collecting and sharing plant health data. Read Greg's full resume [here](#).



DAN TERAVEST

Dan has a PhD in soil science and over 5 years experience working with smallholder farmers in southern and eastern Africa. Most recently he coordinated international research collaborations for the PhotosynQ project at Michigan State University.



MANUEL DI CERBO

BSc. EE FHNW, Switzerland
Managing Director Nexus-Computing GmbH

Manuel has focused on building Android and Web applications for the past ten years. He is currently responsible for building the Android application for Our-Sci, as well as building data visualization and sensor drivers. Prior to this, he built the Android application of PhotosynQ.



FRANK SOMERVILLE

Frank Somerville is a Senior Educator within the Horticultural and Environmental Technologies team at Swinburne University of Technology. He has a diverse background in the Building and Landscape industry for over 35 years and a Qualified Arborist for over 20 years. Frank is a member of the Victorian Tree Industry Organisation (VTIO) where he is regularly utilised as a Senior Judge for their Arboriculture Competitions. He also sits on the sub-committee for Landscaping Victoria, representing the training and education sector.





Masterclass Outline

- 1 The shortfalls in current global Urban Forest management
- 2 Examples of holistic Urban Forest data collection and best practice management
- 3 Measuring Soil Health
- 4 Measuring Photosynthesis
- 5 Measuring Soil Carbon
- 6 Measuring Brix (food quality)
- 7 Designing custom industry-specific sensing tools

NEW TOOLS AND EQUIPMENT

- 1 OurSci/PhotosynQ web-based open source platforms
- 2 Fluorescence/Spectrometers
- 3 CO₂ Sensors for CO₂ Content in Soil and Soil Biology Respiration
- 4 Soil Moisture/Soil Compaction



Program

DAY ONE – FRIDAY 8 JUNE 2018

TIME	PROGRAM	PRESENTER/GUEST SPEAKER
AM		
8.15	Registration Tea/Coffee	All
9.00	Acknowledgement of Country	Lea Jones – Swinburne Indigenous Liaison Officer
9.10	Welcome	Terry McEvoy - Director of Trades and Engineering Technologies, Swinburne
9.15	Introduction to participants + Swinburne's Arboriculture Legacy is to dedicate this event to Scott Sharp	Frank Somerville - Senior Educator of Horticultural and Environmental Technologies Team
9.20	Dedication to Scott Sharp	Ben Inman – Trees Are Cool company
9.25	Introduction to participants and Presenters Bio's + Brief overview of Masterclass + Outcomes + Future plans	Stewart Detez – Manager of Horticultural and Environmental Technologies Team
9.35	A brief look back at the past and what the future brings for Plant Health	Frank Somerville
9.45	Introduction of Advanced Environmental Sensing thinking + The future of understanding and monitoring our environment using advanced sensing processes	Matthew Robin-Daniel – CEO and Founder of Global Urban Forest Pty Ltd
10.30	Morning tea break	All

10.45	Pros and Cons of current Urban Forest data collection + Future potential for associated Industry to obtain advanced environmental sensing + Introduce Our Sci, Nexus, PhotosynQ	Matthew Robin-Daniel
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PM

12.00	Lunch break	All
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1.00	Deliver Case Study practical example from City of Adelaide Veale Gardens PHC Project	Matthew Robin-Daniel
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2.30	Afternoon tea break	All
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3.00	How PhotosynQ and MultispeQ with practical demonstrations	Matthew Robin-Daniel
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4.00	Q&A	All – MC to Facilitate
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4.30	Finish. Join us for drinks, discussions and networking opportunities.	The Groove Train or Gami Chicken & Beer @ Knox O-Zone, Wantirna (TBC)
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DAY TWO – SATURDAY 9 JUNE 2018

TIME	PROGRAM	PRESENTER/GUEST SPEAKER
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AM

9.00	Q&A from previous day's information	Stewart Detez
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9.30	Participants /Presenters online/Skype for interactive discussion	Matthew Robin-Daniel, Greg Austic and Dan TerAvest (USA) and Manuel Di Cerbo (Switzerland)
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10.30	Morning tea break	All
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11.00	Continue Skype Q&A online	All – MC to Facilitate
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PM

12.30	Lunch break	All
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1.30	Q&A feedback + Wrap up and where to from here?	Matthew Robin-Daniel
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2.30	Finish. Join us for afternoon tea.	All
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Collecting Data



Opposite page:
Collecting
Photosynthesis data
using the - PhotosynQ -
MultispeQ v 1.0 Device

Above:
Matthew Robin-Daniel
with the Beta program
(3d printed) MultispeQ -
Beta device

Right:
Global Urban Forest's
MultispeQ device Field
Kit for Community
Engagement Projects





All images, this page:
Carbon Mineralization
Sensor – measuring
CO₂ Respiration of
soil samples for soil
remediation projects.



Collecting Photosynthesis data with
the MultispeQ - Beta prototype



Collecting Soil Compaction Data
using a Penetrometer device.





Collecting Soil Moisture Data.

Thank You



Global Urban Forest
Soil Health • Tree Health



Further information

Swinburne University of Technology

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CRICOS Provider Code: 00111D

The information contained in this program was correct at the time of publication, May 2018.

The university reserves the right to alter or amend the material contained in this program.